BUILDING RESILIENCY
RETOOLING TO RESIST NATURAL HAZARDS (P. 28)

INSIDE THE TOP 200 ENVIRONMENTAL FIRMS
We live and breathe it.

Electricity. It's vital to you. It's our lifeblood. We're the quality alternative in electrical construction. Check us out.

They harnessed and invented it.

THE TOP 200 ENVIRONMENTAL FIRMS

Resuming real estate and accelerating energy work are among positive market trends, even as lighter public budgets and global politics challenge participants.

COVER STORY

Too Little Progress

Resilient-buildings supporters call for a national Resilient "EZS" to champion the cause of adopting buildings to climate change

SPECIAL REPORT

Contractor Business Quarterly

The latest issue profiles The Beck Group, an innovative Dallas-based company, and features other news, analysis and content specially geared to contractors

NEWS

Infrastructure

Bridge: $210m project for Ohio River crossing includes private-public partnership and design-build contract

Transportation: L. A. commuter rail to roll out first "smart train control" system in U.S.

Wastewater: Blue Plains eyes program to green its CSG operation

ENVIRONMENT

12 Hazardous Waste: Fish kill spurs cleanup of river polluted for a century in Spain

17 Mass Transit: Saudi Arabia chosen for mass-transit program

Business Management

14 Safety & Health: CII research shows potential for safety and productivity gains

15 Associations: Role for business developers seen in forming P3 teams

Policy

18 Transportation: FOX says infrastructure bank and TIFIA won't fill trust-fund gap

Equipment

21 Equipment: Ford is first to offer half-ton pickups with natural gas

UPCOMING ISSUES

Aug. 19 Innovative Projects

Aug. 26 Top International Contractors

Sept. 7 Work Zones and Utilities

Sept. 15 Top Green Contractors
HELP WANTED

A call is out for a national resiliency ‘czar’ to champion and coordinate diverse building initiatives

By Nadine M. Post

Looking for free building vulnerability assessment tools? The Dept. of Homeland Security’s website offers plenty. Details on federal resilience-building initiatives can be found on FEMA’s website. For those seeking post-Sandy advice from insurers or architects, websites such as disasterready.org and postsandysafety.org offer a plenty of natural hazards.

Anyone doing a web search using keywords such as "BOOM NY, ASC/PRI, NIST, NIBA, ASHRAE, ICC or NWA" will discover thousands of results on almost any subject related to resiliency buildings. Scores of pointed reports, advisories and guides on adapting buildings and communities to extreme natural hazards—hurricanes, high winds, floods, storm surges and wildfires—at the urban edges—are available to anyone after just a few clicks. But web searches on the implementation of these resiliency methods yield far less.

Sites that sell removable building barriers and hardened houses are scattered across the web, including plenty with material about amphibious buildings. There is even design guidance for tornado- and tsunami-resistant structures.

Multihazard-mitigation and adaptation planning is not new. Risk-assessment tools and strategies have been available for years. But Sandy’s unprecedented storm surge last Oct. 29, which swamped the coastal Northeast—including Lower Manhattan—turned the private sector’s attention, as never before, toward resilient commercial buildings. Rebuilding and retrofitting planning exploded for all sorts of occupancies.

Though there are dozens of initiatives around resilient buildings, some say there has been little progress toward resiliency. "The U.S. has been somewhat paralyzed in the development of an effective building-resiliency response by the extreme politicization of the topic of climate change," says Ben Sanders-Buell, chief resilience officer for Climate Adaptation Solutions. "The level of political toxicity prevents effective engagement by a large segment of the American body politic, industry, academia, NGOs and media."

One consequence of this "paralysis," says Sanders-Buell, is the absence of national coordination linking diverse initiatives, which results in a failure to achieve a whole that is greater than the sum of its parts.

He has a solution. "The Obama administration can provide (non-partisan) national leadership through the establishment of a building resiliency ‘czar’ with coordinating authority to seek synergies and highlight gaps in current work by uncoordinated public- and private-sector actors," says Sanders-Buell.

Robert A. White, a building regulatory reform consultant, agrees. "We cannot afford to keep reinventing wheels, spending precious public- and private-sector funds and staff time on duplicative and, at times, conflicting actions," says White. "We need someone and some place to connect the dots."

White envisions a resiliency ombudsman who would report to the president or vice president and be housed with a staff in the Office of Science and Technology Policy. The OSSTP is linked to the existing National Science and Technology Council’s Committee on Homeland Security and its subworking group, which consists of representatives from federal agencies that build. The ombudsman would coordinate with stakeholders including: associations, professional societies, academia and groups representing state, regional, and local governments.

A presidential appointment would be helpful because, currently, there is no central clearinghouse, place for discussion or ability to understand the big picture, agrees Ryan Colker, adviser to Henry Green.
AMPHIBIOUS-HOUSE PROMOTER IS ON A CRUSADE FOR NEW HOMES AND RETROFITS THAT GO WITH THE FLOW

ELIZABETH C. ENGLISH-ROTH, a non-profit she founded and directs, to the U.S. Dept. of Housing and Urban Development’s “Rebuild by Design” competition. A UNH press release on Aug. 5, English was among the 10 winners for her project’s innovative solution to the challenges posed by climate change.

“There are two legs to this: the first is homes that are designed to be resilient to climate change and the second is to develop a model for how we can think about how to build for the future,” English said.

The idea behind the project is to create a model for how to build homes that are resilient to climate change and to develop a model for how to design homes that can adapt to changing conditions. This includes designing homes that can withstand floodwaters and provide a safe haven during storms.

STREETSCAPE SAVIOR

The Buzzy Foundation Project’s concept for a flood-tolerant landscape design would preserve the streetscape while draining water. Only the lowest-lying parts of the streets would remain flooded. The project aims to provide a sustainable solution to the problem of flooding in urban areas.

The system would work by creating a network of small, interconnected channels that could be used to divert excess water away from the streets and into nearby bodies of water. This would help to reduce the pressure on the drainage system and prevent street flooding.

This is just one example of how we can design urban spaces to be more resilient to climate change. By incorporating natural systems and incorporating nature into our urban design, we can create more sustainable and livable cities.

THAMES ISLAND RESILIENCE

The Thames Island Resilience project is focused on creating a model for how to build homes and buildings that are resilient to climate change and to develop a model for how to design homes that can adapt to changing conditions.

The project aims to create a model for how to build homes that are resilient to climate change and to develop a model for how to design homes that can adapt to changing conditions. This includes designing homes that can withstand floodwaters and provide a safe haven during storms.

The system would work by creating a network of small, interconnected channels that could be used to divert excess water away from the streets and into nearby bodies of water. This would help to reduce the pressure on the drainage system and prevent street flooding.

This is just one example of how we can design urban spaces to be more resilient to climate change. By incorporating natural systems and incorporating nature into our urban design, we can create more sustainable and livable cities.

National Institute of Building Sciences president.

The National Institute of Building Sciences (NIBS) is an independent, non-profit organization that works to improve the safety, health, and economic performance of the built environment. NIBS conducts research, provides technical assistance, and serves as a clearinghouse for information on building science.

Its mission is to advance knowledge and leadership in building science and technology to create a safer, healthier, and more sustainable built environment. NIBS works with diverse stakeholders to develop practical solutions to complex problems and to foster innovation and collaboration.

In summary, the National Institute of Building Sciences is an important organization that is dedicated to improving the safety, health, and economic performance of the built environment. By working with diverse stakeholders and fostering collaboration, NIBS is helping to create a safer, healthier, and more sustainable built environment for all.
**TESTED AMPHIBIOUS RETROFIT**

The current Retrofit, which is portable, is a standard shelter for a 4-person family. It consists of:
- A 3-room, 1200 sqft house,
- A 150 sqft greenhouse,
- A 50 sqft solar array,
- A 1000-gallon water storage tank,
- A 2500-watt generator,
- A 1500-watt EV charger,
- A 1000-watt wind turbine.

The total cost for this setup is approximately $100,000. A complete installation would cost about $250,000.

On the commercial side, the Building Owners & Managers Association of Greater New York Inc. has been working with the office of Mayor Michael Bloomberg (8) and the New York City Council on pending legislation, prompted by Sandy, to amend zoning and building codes. "We are supportive of the aims of the legislation to move emergency generators, fuel pumps and other critical building systems and are providing the practical side of how the provisions would work," says Sydney A. Giordano, BOMA NY’s director of legislative affairs.

Not too many owners are rushing to move systems to higher ground. "It comes down to whether there is space available and how much revenue will be lost," says John Brandtatter, BOMA NY’s weather-response subcommittee chairman and managing director of the building-resiliency-planning and flood-risk-mitigation consultant that bears his name.

The bigger discussion among existing building owners—driven by insurance companies—is how to pay the water from getting inside in the first place, says Brandtatter. In response, "a lot of people are jumping into the removable-barrier market," he adds. Meanwhile, the standards-writing community has been busy for some time working on extreme-weather issues. The Structural Engineering Institute of the American Society of Civil Engineers is discussing new wind-speed maps for critical and essential facilities. And SEI even expects to include a chapter on tsunami load effects in the 2016 edition of ASCE/SEI 7.

For the first time, the 2015 edition of the model International Building Code (IBC) includes a mandatory storm-shelter provision for certain occupancies, such as schools. FEMA has a program subordinating construction of shelters, which they call "safe rooms."

The next IBC also will have flood-related provisions tied to new risk categories for coastal zones. And stricter wind-load provisions for vertical glazing are coming in the 2015 IBC.

Digital tools to help assess vulnerabilities to all hazards are available for free in the U.S. Dept. of Homeland Security’s Science and Technology Directorate.

Some are developing resilience ratings. FEMA has trademarked "Resilience STAR" for resilient products, such as the USGBC’s LEED cross-building rating. The U.S. Resilience Council has a prototype for a Certification of Resilient Engineering rating, styled after the USGBC’s LEED-green-building rating. Eventually, CoRe will assess safety, repairability and functionality under all hazards. But the first generation will address only earthquake risk. EIBSVN Reinhold is keen of credit-based ratings. Resilience must be evaluated holistically, he says. A weak link can negate resiliency, even if a rating is high. "It is interesting to consider a LEED pilot credit around a third-party criteria, like Resilience STAR," says USGBC’s Pyke. "However, we need these efforts to come into sharper focus before we can take action."

**HARDCORE HOUSE**

Defib Homes has built some 1,000 homes in coastal areas of the U.S. and the Caribbean since 1998. They have been subjected to Hurricanes Sandy, Katrina, Irene, Ike, Gustav, Wilma, Rita, Ivan, Charley and Andrew. Defib says it has never lost one of its houses to high winds. Construction costs range between $125,000 and $200,000. For a 2,000-sqft house, not including the lot.

**SHOWER**

1. Retainable pressure shower head on all sides
2. Reinforced clear glass door has panic for wind
3. Circular structure transfers environmental loads efficiently

**ENGINEERING**

1. Steel cable girders in roof and floors
2. Potential contained wind energy is dispersed throughout structure

**MATERIALS**

1. Steel plate hanger floor system to roof
2. Multiple construction tie from walls to floors to transfer shear forces
3. Reinforced metal decking from roof to foundation

**CONNECTIONS**

1. Metal gusset plate anchors girders anchor system to roof
2. Multiple construction tie from walls to floors to transfer shear forces
3. Reinforced metal decking from roof to foundation

**HARDENED HOUSE**

Defib Homes has built some 1,000 homes in coastal areas of the U.S. and the Caribbean since 1998. They have been subjected to Hurricanes Sandy, Katrina, Irene, Ike, Gustav, Wilma, Rita, Ivan, Charley and Andrew. Defib says it has never lost one of its houses to high winds. Construction costs range between $125,000 and $200,000. For a 2,000-sqft house, not including the lot.

**VETERAN FLOATATION**

Amphibious houses (left) in MASSPORT, Mass. The settlements' float on buoyant foundations (right). They were built in 2007.

mence's Hurricane Sandy Task Force is set to release its rebuilding strategy on Aug. 19. HUD announced, on Aug. 9, the 10 winners of its regional "Rebuild by Design" competition to promote innovation in resilient buildings. HUD plans to fund construction of the winning concepts using some of the $1.52 billion in community-development block grants the U.S. Congress appropriated for post-Sandy rebuilding.

There are local concerns, too. On Oct. 3, AIA New York will announce the winner of the "For a Resilient Rockaway" competition to gather ideas for a sustainable community on the 86-acre waterfront site in Queens.

On June 13, AIA and Architecture for Humanity announced an ideas competition for resilient communities. And on May 7, FEMA announced 30 recipients of up to $15,000 in seed money from the FEMA 2012 Community Resilience Innovation Challenge. In June, President Obama directed federal agencies

to make sure any new project funded with taxpayer dollars is built to withstand increased flood risks. To help, the National Oceanic and Atmospheric Administration and the U.S. Army Corps of Engineers released a sea-level-rise planning tool that provides users with information about future risks of coastal flooding in parts of New York and New Jersey.

"We are all still taking baby steps when it comes to understanding what resilient communities really are and what resilient standards might look like in the future," says Kevin Stanley, CEO of landscape architect SWA Group. "For now, it's really perfect that so many people are talking about the issues and are exploring possible solutions. The optimal strategies should emerge from this currently confusing but ultimately efficient creative effort," Stanley adds. "In time, standards-setting bodies can adopt the best approaches."